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Simple sighting for the Future Infantry Soldier

It is ironic that, when you are building a business, you have to pay to give away pearls of wisdom. When the business succeeds, and demand is high, you can charge for your services. To him that hath, much shall be added.

My talks over the years have been like the sown grain. Some fell on the stones, some on fertile ground, some hasn't yet germinated. But two seeds have done well: the P90 sight and shooting with Night Goggles.

I must, as the French say, return to my sheep. I cannot return to my good British beef as this is a European conference and beef exporting is forbidden. I will take the NVG talk of 1993 into the 21st Century.

You have heard what nations are doing for their soldiers in the future: basically a means of presenting information to the soldier's eyes such as HOPROS: the Delft Sensor Systems Head-mounted Optical PROjection System.

It reminds me of a silent attack I was in over fifty years ago. As we walked through the German defences, keeping as quiet as we could, I kept being asked on the radio where we had got to - the last noise I wanted. I expect the same sort of thing will happen - just as he is aiming his rifle a map will appear all over his field of view.

But how is he to aim his weapons? One solution is to provide each weapon with an electronic sight which inserts an aiming mark into the firer's view. Each weapon has to have a dedicated sight generating that weapon's ballistics or graticule. A general purpose sight, common to all weapons, is not possible. The sight has to be zeroed to the weapon and, maybe, to the firer. We have found, for rifle launched grenades, that the zero is very firer dependent.

And what happens if and when this dedicated sight fails? Does a back-up sight have to be provided?

There is another solution which is simpler, more military and which, if sophistication fails, leaves the soldier still able to fight (it is probably cheaper too).

Each weapon is fitted with a reflex collimator sight, zeroed to the weapon, with a graticule pattern suited to that weapons role. This sight has an interface which accepts a sensor connected to the helmet display. Here is the notional layout.

The graticule image is injected into the sensor lens by the sight. The sensor lens can also look around the sight, or through it, depending on the sensor lens aperture. The soldier sees the aiming mark superimposed on the target scene and moves the weapon to put the aiming mark on the target (as in the desert scene already shown).

The sensor and its interface are common to all sights so that the soldier, who can only aim one weapon at one time, can plug his sensor onto any weapon (very convenient for throwaway anti-armour or anti-aircraft weapons).

If he needs magnification he plugs on a magnifying sensor which, to identify the target, he can first use above the parapet without having to aim a weapon.

And, if his sensor or helmet fails, he can fall back on good old-fashioned aiming using the sight with his naked eye.

Here is a precursor of the system. The FN P90 fitted with an inline night vision monocular. Replace the monocular with a sensor and, hey presto, you can plug it into HOPROS and dominate the enemy. No need to shoulder the weapon or even to expose yourself since the recoil is so low. Maybe I will want it after all.

Here is a rifle grenade sight, the LC-9-46-RGGS, which we are producing for the British Army. You can use it by day and night and with Night Vision Goggles. It could have a sensor rail so that it continues into the future. But what about aiming the rifle itself? No problem: there is a rifle aiming mark on the graticule so that you can aim the rifle or the grenade without moving the sensor. Just what is needed for the OICW or PAPOP!

But, you will be asking yourselves, what about thermal imaging? We can solve this too. We build in, on top of the sight a thermal collimator. Here is the layout.

It consists of a thermal graticule, i.e. a pattern which shows up against its background, and a reflector to focus it at infinity, all in the open air to avoid the cost of special lenses. This collimator is lined up with its reflex sight in production so zeroing is as per usual: no need for special zeroing kit. I read, in the New Scientist, about a cheap infra-red camera being developed at the Oak Ridge National Laboratory. It too uses a concave mirror to focus the scene onto the detector.

So I see the infantry soldier in the 21st Century with reflex collimator sights on all his weapons plugging the sensor he needs at the time and being really effective. Not only that, we could have this effectiveness displayed on TV for the commander and even in our homes.